

Comparative Assessment Of Acreage And Productivity Of Rice Crop In A Normal And A Drought-Like Year In Meghalaya

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Abstract

Rice being the major staple food for the state of Meghalaya grown throughout the state accounting 78.38% total areas under food-grains cultivation in the state. In the present study, it has attempted to make a comparative assessment of area and productivity under winter rice, which covers 90% of the total area under paddy with the help of satellite remote sensing technology and geographic information system (GIS) in a drought-like year (2006) and normal year (2008). Using Resourcesat-1 LISS III data, supervised maximum likelihood classification was preceded for delineating different land cover types along with total crop areas followed by delineation of rice growing areas by Normalized Difference Vegetation Index (NDVI). Normalised Difference Wetness Index (NDWI) calculated with the reflectance of near infrared and short wave infrared were used to correlate with its mean value and the productivity of a drought and normal year along with NDVI. It has been observed that the regression models used to explain the relationship of vegetation indices with the district-wise productivity could explain about 50-71% variation in the model as shown by R² value. Unavailability of images in the right growth season coupled with problem of cloud cover has also attributed to lower range of R² values. Crop condition index (CCI) was generated to calculate and track the condition of the crop with satellite derived NDVI and it was assessed by comparing the NDVI values of the drought and the normal year. Crop conditions were categorised into five classes based on the range of the CCI values and observed the extent of relationship with the productivity. No significant relationship could be established between observed CCI values with district level productivity, reasons of which need further investigation.

Keywords: Rice, Acreage, Productivity, Vegetation indices, Remote Sensing, GIS